AUSTRALIAN ENERGY REGULATOR

First Proposed

Electricity Transmission Network Service Providers

Roll Forward Model

Handbook

Issue No: 01

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AMENDMENT RECORD

Version no.	Date	Pages
01	January 07	20

Contents

1 Nature and authority

1.1 Introduction

This handbook sets out the Australian Energy Regulator's (AER) First Proposed Roll Forward Model (roll-forward model). The roll-forward model is a series of Microsoft Excel spreadsheets (attached), developed in accordance with the requirements of clause 6A.6.1 of the National Electricity Rules (NER).

1.2 Authority

Clause 6A.6.1 of the NER requires the AER to develop the roll-forward model, in accordance with the transmission consultation procedures.

1.3 Role of the model

The roll-forward model will be used by the AER to determine the closing *regulatory asset base (RAB)* for future regulatory periods. The closing *RAB* figure as calculated by the roll forward model then becomes the opening *RAB* to be used for the purposes of making a transmission determination for the following regulatory period.

1.4 Confidentiality

The AER's obligations regarding confidentiality and the disclosure of information provided to it by a TNSP are governed by the *Trade Practices Act 1974*, the National Electricity Law (NEL) and the NER.

1.5 Definitions and interpretation

(a) In this handbook, the words and phrases presented in italics *such as this* are defined in the glossary in section 3 of this handbook and have the meaning given to them in that section.

(b) Words and phrases not defined in the glossary have the meaning, if any, given to them in the NER.

(c) Explanations in this handbook about why certain information is required are provided for guidance only.

1.6 Process for revision

The AER may amend or replace the roll-forward model from time to time in accordance with clause 6A.6.1(c) of the NER and the transmission consultation procedures. A subsequent version of this handbook will accompany each subsequent version of the roll-forward model.

1.7 Version history and effective date

An issue number and an effective date of issue will identify each version of this handbook.

2 The model

The roll-forward model is a set of Microsoft Excel spreadsheets which perform iterative calculations to derive a closing *RAB* for the current regulatory period, from a given set of inputs. The roll-forward model allows the user to vary the inputs in order to assess their impact on the output data, and other derived parameters.

2.1 Input sheet

The **Input** sheet provides for key input variables to be entered in the roll-forward model. These inputs are automatically linked to corresponding cells in the relevant worksheets. Values should be entered into each cell with light blue shading. The input variables have been split into five categories:

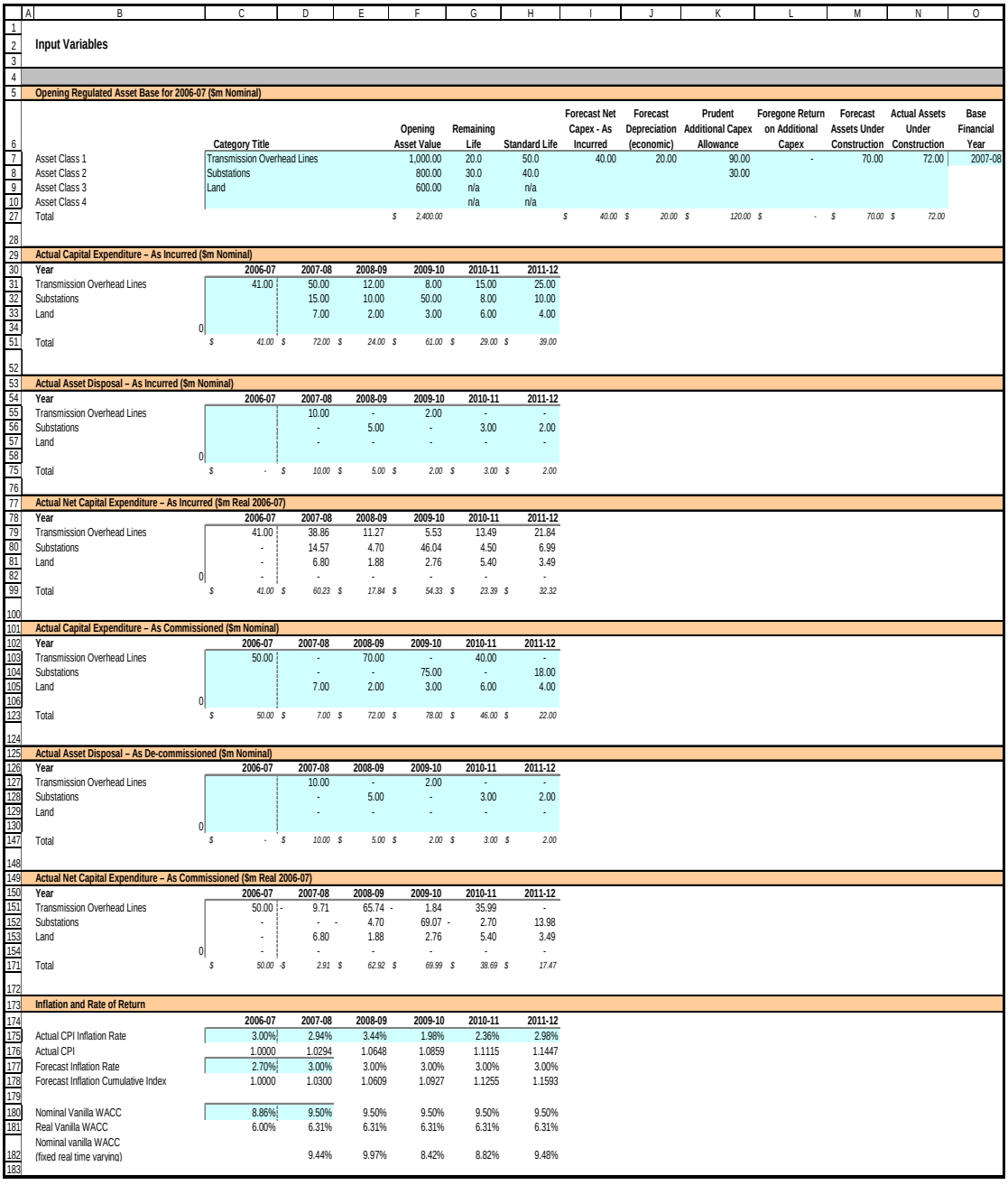
- opening *RAB*
- actual nominal capital expenditure (*capex*) – as incurred
- actual nominal asset disposals – as incurred
- actual real net *capex* – as incurred
- actual nominal *capex* – as commissioned
- actual nominal asset disposals – as de-commissioned
- actual nominal net *capex* – as commissioned
- inflation and rate of return.

The input data to be recorded in the roll-forward model must be in a consistent format as the input data collected from TNSPs in accordance with the AER's submission guidelines.

Figure 1 provides an example of the **Input** sheet.

The roll-forward model records data for a six-year period. This includes the final year of the previous regulatory period, as well as the (assumed) five years of the current regulatory period. The roll-forward model can be adjusted to account for regulatory periods of longer than five years, as is allowed under the NER.

Figure 1: Input sheet



Input Variables

Opening Regulated Asset Base for 2006-07 ($m Nominal)

	Category Title	Opening Asset Value	Remaining Life	Standard Life	Forecast Net Capex - As Incurred	Forecast Depreciation (economic)	Prudent Additional Capex Allowance	Foregone Return on Additional Capex	Forecast Assets Under Construction	Actual Assets Under Construction	Base Financial Year
Asset Class 1	Transmission Overhead Lines	1,000.00	20.0	50.0	40.00	20.00	90.00	-	70.00	72.00	2007-08
Asset Class 2	Substations	800.00	30.0	40.0			30.00				
Asset Class 3	Land	600.00	n/a	n/a							
Asset Class 4			n/a	n/a							
Total		$ 2,400.00			$ 40.00	$ 20.00	$ 120.00	$ -	$ 70.00	$ 72.00	

Actual Capital Expenditure – As Incurred ($m Nominal)

Year	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12
Transmission Overhead Lines	41.00	50.00	12.00	8.00	15.00	25.00
Substations		15.00	10.00	50.00	8.00	10.00
Land		7.00	2.00	3.00	6.00	4.00
	0					
Total	$ 41.00	$ 72.00	$ 24.00	$ 61.00	$ 29.00	$ 39.00

Actual Asset Disposal – As Incurred ($m Nominal)

Year	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12
Transmission Overhead Lines		10.00	-	2.00	-	-
Substations		-	5.00	-	3.00	2.00
Land		-	-	-	-	-
	0					
Total	$ -	$ 10.00	$ 5.00	$ 2.00	$ 3.00	$ 2.00

Actual Net Capital Expenditure – As Incurred ($m Real 2006-07)

Year	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12
Transmission Overhead Lines	41.00	38.86	11.27	5.53	13.49	21.84
Substations	-	14.57	4.70	46.04	4.50	6.99
Land	-	6.80	1.88	2.76	5.40	3.49
	0 -	-	-	-	-	-
Total	$ 41.00	$ 60.23	$ 17.84	$ 54.33	$ 23.39	$ 32.32

Actual Capital Expenditure – As Commissioned ($m Nominal)

Year	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12
Transmission Overhead Lines	50.00	-	70.00	-	40.00	-
Substations		-	-	75.00	-	18.00
Land		7.00	2.00	3.00	6.00	4.00
	0					
Total	$ 50.00	$ 7.00	$ 72.00	$ 78.00	$ 46.00	$ 22.00

Actual Asset Disposal – As De-commissioned ($m Nominal)

Year	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12
Transmission Overhead Lines		10.00	-	2.00	-	-
Substations		-	5.00	-	3.00	2.00
Land		-	-	-	-	-
	0					
Total	$ -	$ 10.00	$ 5.00	$ 2.00	$ 3.00	$ 2.00

Actual Net Capital Expenditure – As Commissioned ($m Real 2006-07)

Year	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12
Transmission Overhead Lines	50.00	- 9.71	65.74	- 1.84	35.99	-
Substations	-	- -	4.70	69.07	- 2.70	13.98
Land	-	6.80	1.88	2.76	5.40	3.49
	0 -	-	-	-	-	-
Total	$ 50.00	-$ 2.91	$ 62.92	$ 69.99	$ 38.69	$ 17.47

Inflation and Rate of Return

	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12
Actual CPI Inflation Rate	3.00%	2.94%	3.44%	1.98%	2.36%	2.98%
Actual CPI	1.0000	1.0294	1.0648	1.0859	1.1115	1.1447
Forecast Inflation Rate	2.70%	3.00%	3.00%	3.00%	3.00%	3.00%
Forecast Inflation Cumulative Index	1.0000	1.0300	1.0609	1.0927	1.1255	1.1593
Nominal Vanilla WACC	8.86%	9.50%	9.50%	9.50%	9.50%	9.50%
Real Vanilla WACC	6.00%	6.31%	6.31%	6.31%	6.31%	6.31%
Nominal vanilla WACC (fixed real time varying)		9.44%	9.97%	8.42%	8.82%	9.48%

Opening regulated asset base

The opening *RAB* is the value of assets on which a return will be earned. The **Input** sheet requires a value for the opening *RAB* (broken into asset classes) at the start of the final year of the previous regulatory period. The *RAB* will fluctuate each year to reflect new *capex* (as incurred), asset disposals and depreciation.

The recorded values are linked to the subsequent sheets which calculate a running balance of the *RAB* for the six-year period.

Category title

The asset classes/names are recorded in column C. It is important that the number of asset classes recorded in the *RAB* section matches the number of asset classes

identified in the *capex* section. This allows the roll-forward model to model consistent depreciation across the asset classes.

The roll-forward model is configured to accommodate up to 20 asset classes.[1] The number of asset classes used in the roll-forward model will vary between businesses. However, for each business, the number of asset classes used in the roll-forward model must be consistent with that used in the AER's post-tax revenue model (PTRM).

Opening asset value

The opening asset values for each asset class are recorded in column F.

Remaining life

The remaining life of the asset classes are recorded in column G, based on the economic life of the assets. These are calculated in the PTRM used in the last reset.

Standard life

The standard life of the assets is recorded in column H and measures how long the infrastructure would physically last if it had just been built.

Forecast net capex – as incurred

The forecast net *capex* for each asset class is recorded in column I. It is based on the forecast made in the final year of the previous regulatory period, contained in the roll forward model used in the previous transmission determination. The forecast net *capex* values are linked to the **Adjustment for previous period** sheet.

Forecast nominal depreciation

The forecast nominal depreciation for each asset class is recorded in column J. It is based on the forecast made for the final year of the previous regulatory period, contained in the previous roll-forward model. The forecast nominal depreciation values are linked to the **Adjustment for previous period** sheet.

Prudent additional capex allowance

The prudent additional *capex* allowance for each asset class is recorded in column K. This data may be required for TNSPs transitioning to an as incurred methodology for recognising *capex*. In the case of a *capex* overspend on forecasts from the previous period, the amount of prudent additional *capex* allowed in the previous regulatory period is added to the opening *RAB* for the current period. It is assumed that the amount of prudent additional *capex* (if any) was calculated in the previous roll-forward model. This input data is linked to the **Adjustment for previous period** sheet.

Foregone return on additional capex

The foregone return on additional *capex* for each asset class is recorded in column L. This data may be required for TNSPs transitioning to an as incurred methodology for recognising *capex*. In the case of a *capex* overspend on forecasts from the previous period, the foregone return associated with the amount of prudent additional *capex* allowed in the previous regulatory period may be added to the opening RAB for the current period. It is assumed that the amount of foregone return on additional *capex* (if

[1] The roll-forward model can be expanded to accommodate additional asset classes, when necessary.

any) was calculated in the previous roll-forward model. This input data is linked to the **Adjustment for previous period** sheet.

Forecast assets under construction

The forecast *assets under construction*, for each asset class, is recorded in column M. This data may be required for TNSPs transitioning to an as incurred methodology for recognising *capex*, in which case forecast *assets under construction* would have been added to the closing *RAB* for the previous period, contained in the previous roll-forward model. The forecast *assets under construction* values are linked to the **Adjustment for previous period** sheet.

Actual assets under construction

The actual *assets under construction*, for each asset class, is recorded in column N, based on the actual *assets under constructions* values for the final year of the previous regulatory period. This data may be required for TNSPs transitioning to an as incurred methodology for recognising *capex*. This actual *assets under construction* values are linked to the **Adjustment for previous period** sheet.

Base financial year

The financial year for the start of the current regulatory period is recorded in cell O7.

Actual nominal capex – as incurred

The actual *capex* incurred for the six-year period is recorded for each asset class in rows 31 to 50.[2] Generally, *capex* falls into three broad categories:

- asset augmentation (works to enlarge a network or to increase the capability of a network).
- asset replacement (replacing assets that have passed their useful lives)
- asset refurbishment (prolonging the life of an asset)

Actual nominal asset disposals – as incurred

The value of actual asset disposals that have taken place in the six-year period is recorded in rows 55 to 74.

Actual real net capex – as incurred

This section on real net *capex* does not require inputs to be directly recorded. For each asset class, actual real net *capex* is calculated based on the recorded nominal *capex* less asset disposal values, adjusted for actual inflation. The real net *capex* as incurred values, for each year, are rolled into the *RAB* in the **Adjustment for previous period** and **Actual RAB roll forward** sheets.

Actual nominal capex – as commissioned

The actual nominal as commissioned *capex* values are recorded in rows 103 to 122, and are used for the purposes of calculating depreciation.[3]

Actual asset disposals – as de-commissioned

[2] This six-year period includes the final year of the previous regulatory period.

[3] In other words, the roll forward model can be described as a 'hybrid' model – whereby return on capital is based on as incurred *capex*, and return of capital (depreciation) is based on as commissioned *capex*.

The value of de-commissioned assets is recorded, for each year, in rows 127 to 146.

Actual net capex – as commissioned

For each asset class, actual real net *capex* as commissioned is calculated based on the recorded nominal *capex* as commissioned, less the value of de-commissioned assets, adjusted for actual inflation. The real net *capex* as commissioned values, for each year, are used to calculate depreciation in the **Actual RAB roll forward** sheet.

Inflation and rate of return

This section records the actual inflation rates over the current regulatory period and in the final year of the previous regulatory period. It also records the forecast inflation and WACC rates used in the transmission determinations corresponding to the two regulatory periods. Each of these parameters is linked to the **Adjustment for previous period** and **Actual RAB roll forward** sheets.

2.2 Adjustment for previous period sheet

Broadly, the **Adjustment for previous period** sheet adjusts, for the final year of the previous period, for the difference between:

1) forecast and actual inflation rates,
2) forecast and actual net *capex* data, and
3) forecast and actual *assets under construction*.

First, this sheet uses the opening *RAB* in the final year of the previous regulatory period to determine the closing *RAB* for that year by adjusting for the difference between actual and forecast inflation, as well as any once-off adjustments needed to transition to an as incurred methodology for recognising *capex* (see rows 238 to 594 in Figure 2). This adjustment process is set out in Box 1.

Box 1 – Adjusting for actual inflation in final year of previous regulatory period, and calculating the opening RAB for the current period

Adjusting nominal values for actual inflation

Opening *RAB* for final year of previous regulatory period

\+ Adjustment to opening *RAB* for difference between forecast and actual CPI

\+ Forecast net *capex* adjusted for the difference between forecast and actual CPI

– Forecast nominal (economic) depreciation adjusted for the difference between forecast inflation and actual CPI

\+ Forecast *assets under construction* adjusted for the difference between forecast inflation and actual CPI

= Closing *RAB* for final year of previous regulatory period

\+ Nominal Prudent additional *capex* allowance from previous period (if any)

\+ Nominal foregone return on prudent additional *capex* allowance from previous period (if any)

= Opening *RAB* for first year of current regulatory period

Where:

- Forecast nominal net *capex* = the forecast net *capex* allowed for the final year of the previous regulatory period.
- Forecast nominal depreciation = forecast accounting depreciation – forecast inflation adjustment on the opening *RAB*.
- Forecast *assets under construction* = the forecast *assets under construction* for the final year of the previous regulatory period.
- The prudent additional *capex* allowance, and the foregone return on that amount, are once-off adjustments to the closing RAB for the previous regulatory period, and may be required for TNSPs transitioning to an as incurred methodology for recognising *capex*.

Second, this sheet calculates the difference between forecast and actual net *capex* for the final year of the previous regulatory period, as well as the aggregate compounded return on that difference (rows 16 to 123). This adjustment is made to the closing *RAB* at the end of the current regulatory period, in the **Total actual RAB roll forward** sheet. This two-step process is outlined in Box 2.

Box 2 - Adjusting for actual capex in final year of previous regulatory period

1) Calculating the difference between actual and forecast net capex

Nominal actual net *capex* (including a half-WACC allowance)

– Nominal forecast net *capex* (adjusted for actual inflation)

= Nominal difference between actual and forecast net *capex* (adjusted for actual inflation)

2) Calculate the allowed return on the difference, and compound it for each year of the current regulatory period

Note:

- Nominal forecast net *capex* = the forecast net *capex* allowed for the final year of the previous regulatory period.
- Nominal actual net *capex* = the actual net *capex* incurred during the final year of the the previous regulatory period.
- The allowed return on the difference between actual and forecast net *capex* is calculated by applying the nominal vanilla WACC (adjusted for actual inflation) applicable to the current regulatory period (as set in the previous revenue cap decision).
- Each of these adjustments are made to the final closing *RAB* for the current regulatory period, in the **Total actual RAB roll forward** sheet.

Third, this sheet calculates the difference between forecast and actual *assets under construction* for the final year of the previous regulatory period, as well as the aggregate compounded return on that difference (rows 127 to 234). This adjustment is also made to the closing *RAB* at the end of the current regulatory period, in the **Total actual RAB roll forward** sheet. This two-step process is outlined in Box 3.

Box 3 - Adjusting for actual assets under construction in final year of previous regulatory period

1) Calculating the difference between actual and forecast assets under construction

Nominal actual *assets under construction*

– Nominal forecast *assets under construction*

= Nominal difference between actual and forecast *assets under construction* (adjusted for actual inflation)

2) Calculate the allowed return on the difference, and compound it for each year of the current regulatory period

Note:

- Forecast *assets under construction* = the forecast *assets under construction* for the final year of the previous regulatory period.
- Actual *assets under construction* = the actual *assets under construction* as at the end of the final year of the previous regulatory period.
- The allowed return on the difference between actual and forecast *assets under construction* is calculated by applying the nominal vanilla WACC (adjusted for actual inflation) applicable to the current regulatory period (as set in the previous revenue cap decision).
- Each of these adjustments are made to the final closing *RAB* for the current regulatory period, in the **Total actual RAB roll forward** sheet.

Figure 2 provides an example of the **Adjustment for previous period sheet**.

Figure 2: Adjustment for previous period sheet

	A	B	C	D	E	F	G	H	I	J	K	L
1												
2		**Adjustments for Previous Regulatory Period**										
3												
4		**Year**					**2006-07**	**2007-08**	**2008-09**	**2009-10**	**2010-11**	**2011-12**
5												
6		Actual CPI Inflation Rate					3.00%					
7		Actual CPI				1.0000	1.0300					
8		Previous Forecast Inflation Rate					2.70%					
9		Previous Forecast Inflation Cumulative Index				1.0000	1.0270					
10												
11		Previous Real Vanilla WACC					6.00%					
12		Nominal Vanilla WACC						9.44%	9.97%	8.42%	8.82%	9.48%
13												
14		**Nominal Adjustments for Difference Between Forecast and Actual Capex**										
15												
16		Nominal Forecast Net Capex (previous regulatory period)					40.00					
37												
38		Nominal Actual Net Capex					42.21					
59												
60		Nominal Difference Between Actual and Forecast Net Capex					2.09					
81												
82		Compounded Return on Difference - Net Capex						0.20	0.23	0.21	0.24	0.28
123		*Total Return at End of Regulatory Period*										1.16
124												
125		**Nominal Adjustments for Difference Between Forecast and Actual Assets Under Construction**										
126												
127		Nominal Forecast Assets Under Construction (previous regulatory period)					70.00					
148												
149		Nominal Actual Assets Under Construction					72.00					
170												
171		Nominal Difference Between Actual and Forecast Assets Under Construction					1.80					
192												
193		Compounded Return on Difference - Assets Under Construction						0.17	0.20	0.18	0.21	0.24
234		*Total Return at End of Regulatory Period*										1.00
235												
236		**Nominal Roll Forward for Final Year of Previous Regulatory Period (forecast CPI)**										
237												
238		Nominal Opening Regulated Asset Base					2,400.00	2,610.00				
259												
260		Nominal Forecast Net Capex					40.00					
281												
282		Nominal Forecast Depreciation (economic)					- 20.00					
303												
304		Nominal Prudent Additional Capex Allowance					120.00					
325												
326		Nominal Foregone Return on Prudent Additional Capex					-					
347												
348		Nominal Forecast Assets Under Construction					70.00					
369												
370												
371												
372		Nominal Forecast Straight-line Depreciation					- 84.80					
393												
394		Nominal Forecast Inflation on Opening Asset Base					64.80					
415												
416		**Nominal Roll Forward for Final Year of Previous Regulatory Period (actual CPI)**										
417												
418		Nominal Opening Regulated Asset Base					2,400.00	2,617.27				
439												
440		Nominal Forecast Net Capex					40.12					
461												
462		Nominal Forecast Depreciation (economic)					- 13.05					
483												
484		Nominal Prudent Additional Capex Allowance					120.00					
505												
506		Nominal Foregone Return on Prudent Additional Capex					-					
527												
528		Nominal Forecast Assets Under Construction					70.20					
549												
550												
551												
552		Nominal Forecast Straight-line Depreciation					- 85.05					
573												
574		Nominal Actual Inflation on Opening RAB					72.00					
595												

Nominal adjustments for difference between forecast and actual capex

This section calculates the difference between forecast and actual *capex* for the final year of the previous regulatory period, and determines the return on that difference. The process involved is equivalent to that depicted in Box 2 above.

The nominal forecast net *capex* for each asset class in the final year of the previous regulatory period is displayed in rows 17 to 36. This data is sourced from the **Input** sheet.

The nominal actual net *capex* for each asset class in the final year of the previous regulatory period is calculated in rows 39 to 58. Given the assumption that *capex* on average takes place half-way through the year, a half-year real vanilla WACC is applied to the actual net *capex* for each asset class, to 'gross-up' the actual figure.

The difference between the actual and forecast net *capex* (at actual CPI) values is calculated in rows 61 to 80.

Finally, in rows 83 to 122 a nominal vanilla WACC (row 12) is applied to calculate the return on the difference, which is compounded over the five years of the current regulatory period. The total compounded return at the end of the current regulatory period is displayed in cell L123. This figure is linked to the **Total actual RAB roll forward** sheet (see Figure 4).

Nominal adjustments for difference between forecast and actual assets under construction

This section calculates the difference between forecast and actual *assets under construction* for the final year of the previous regulatory period, and determines the return on that difference. The process involved is equivalent to that depicted in Box 3 above.

The nominal forecast *assets under construction* in the final year of the previous regulatory period is displayed, for each asset class, in rows 128 to 147. This data is sourced from the **Input** sheet.

The nominal actual *assets under construction* in the final year of the previous regulatory period is displayed (for each asset class) in rows 150 to 169. This data is sourced from the **Input** sheet.

The difference between the actual and forecast *assets under construction* (at actual CPI) is calculated in rows 172 to 191.

Finally, in rows 194 to 233 a nominal vanilla WACC (row 12) is applied to calculate the return on the difference, which is compounded over the five years of the current regulatory period. The total compounded return at the end of the current regulatory period is displayed in cell L234. This figure is linked to the **Total actual RAB roll forward** sheet (see Figure 4).

Nominal roll forward for final year of previous regulatory period (forecast CPI)

This section calculates the closing *RAB* for the final year of the previous regulatory period, based on the inflation, *capex*, depreciation and *assets under construction* forecasts used in the previous regulatory period (as well as any additional transitional adjustments that may be required).

Nominal roll forward for final year of previous regulatory period (actual CPI)

This section calculates the closing *RAB* for the final year of the previous regulatory period, based on the actual CPI data. The process involved is equivalent to that depicted in Box 1 above.

The nominal forecast net *capex* for the final year of the previous period is adjusted for actual CPI. The sum of the amounts shown in rows 441 to 460 is rolled into the opening *RAB* for the first year of the current regulatory period.

The nominal forecast depreciation is calculated as nominal straight-line depreciation adjusted for actual CPI (rows 553 to 572) less the inflation on the opening *RAB* for the final year of the previous period (rows 575 to 594). The amounts shown in rows 463 to 482 are deducted from the opening *RAB* for the first year of the current regulatory period.

The nominal forecast *assets under construction* is adjusted for actual CPI (rows 529 to 528) and rolled into the opening *RAB* for the first year of the current regulatory period.

The nominal prudent additional *capex* allowance from the previous regulatory period (if any), as well as the foregone return on that amount (if any) are included as a once-off addition to the opening *RAB* for the first year of the current regulatory period. These adjustments may be applicable to TNSPs transitioning to an as incurred methodology for recognising *capex*.

Nominal opening RAB

The nominal opening *RAB* for the first year of the current regulatory period (cell H418) is calculated based on the forecast *capex*, depreciation and *assets under construction* values adjusted for actual CPI (as well as any additional transitional adjustments that may be required). This opening *RAB* appears again in the **Actual RAB roll forward** sheet (see Figure 3) so that the roll forward of the *RAB* can be undertaken for the current regulatory period.

2.3 Actual RAB roll forward sheet

The **Actual *RAB* roll-forward** sheet calculates the nominal closing *RAB* for each year of the current regulatory period.

Schedule 6A.2 of the NER requires that, in rolling forward the *RAB* from year to year during the current regulatory period, the AER must have regard to actual data only.

It is possible that a TNSP may overspend or underspend the *capex* allowance during the current regulatory period. Such variances may be caused by unforeseen increases or decreases in demand, higher than expected costs of construction or forecasting error. The roll-forward model handles such variances by adjusting the closing *RAB* to reflect the actual *capex* and actual depreciation for the year. On the basis of the incentive framework set out in Chapter 6A, there is to be no additional adjustment in rolling forward the asset base to account for the above/below forecast returns resulting from the over/under spend in the regulatory period.

For example, in relation to a lower than forecast *capex* being spent, the TNSP retains both associated returns on and of capital for the period. Conversely, in relation to a higher than forecast *capex* being spent, the TNSP is not compensated for returns on and of capital foregone.

The process for rolling forward the *RAB* from year to year is set out below in Box 3.

Box 4 – Rolling forward the RAB in the current period

Rolling actual capex and depreciation amounts into the RAB

Opening *RAB* for Year 1

\+ Nominal actual net *capex* for year 1

– Nominal actual (economic) depreciation for year 1

= Closing *RAB* for Year 1

= **Opening *RAB* for Year 2**

\+ Nominal actual net *capex* for year 2

– Nominal actual (economic) depreciation for year 2

= Closing *RAB* for Year 2

= Opening *RAB* for Year 3

…

= Closing *RAB* for Year 5

= Interim closing *RAB* for the current regulatory period

Where:

- Opening *RAB* for Year 1 = The closing *RAB* for year five of the previous regulatory period, calculated in accordance Box 1 above.
- Nominal actual net *capex* = Real actual net *capex* (with real half-vanilla WACC allowance included), adjusted for actual CPI.
- Nominal actual (economic) depreciation = Nominal actual straight line depreciation – inflation adjustment on the opening *RAB*.

Note:

- Formulae for the *RAB* roll forward between year 3 and year 5 have been omitted from the above illustration.
- The interim closing *RAB* for the current regulatory period becomes the opening *RAB* for the next regulatory period, after the final adjustments for the previous period are made (these adjustments are included in the **Total actual *RAB* roll forward sheet** – see Box 4 below for a description.

Figure 3 provides an example of the **Actual RAB roll forward** sheet.

Figure 3: Actual RAB roll forward sheet

	A	B	C	D	E	F	G	H	I	J	K	L
1												
2		**Asset Base Roll Forward**										
3												
4		**Year**				**2006-07**	**2007-08**	**2008-09**	**2009-10**	**2010-11**	**2011-12**	**2012-13**
5												
6		Actual CPI Inflation Rate				3.00%	2.94%	3.44%	1.98%	2.36%	2.98%	
7		Actual CPI				1.0000	1.0294	1.0648	1.0859	1.1115	1.1447	
8												
9		**Real Asset Values**										
10												
11		Real Actual Net Capex					62.10	18.40	56.02	24.12	33.33	
32												
33		Real Actual Straight-line Depreciation				-	86.90	- 86.70	- 87.94	- 89.68	- 90.35	
194												
195		**Nominal Asset Values**										
196												
197		Nominal Opening Regulated Asset Base				2,400.00	2,617.27	2,668.66	2,687.75	2,706.35	2,697.33	2,712.52
218												
219		Nominal Actual Net Capex				40.12	63.93	19.59	60.83	26.81	38.15	
240												
241		Nominal Actual Depreciation (economic)				- 13.05	- 12.54	- 0.50	- 42.23	- 35.83	- 22.96	
262												
263		Nominal Prudent Additional Capex Allowance				120.00						
284												
285		Nominal Foregone Return on Prudent Additional Capex				-						
306												
307		Nominal Assets Under Construction				70.20						
328												
329												
330												
331		Nominal Actual Straight-line Depreciation				- 85.05	- 89.46	- 92.32	- 95.49	- 99.68	- 103.43	
352												
353		Nominal Actual Inflation on Opening RAB				72.00	76.92	91.82	53.26	63.86	80.46	
374												

Real asset values

The real actual net *capex* data (including a half real vanilla WACC allowance) for each year of the current regulatory period is displayed in rows 12 to 31.

These *capex* as incurred values for the current regulatory period (sourced from the **Input** sheet) are those provided by the TNSPs to the AER for the purpose of rolling forward their asset base for the end of the current regulatory period.

The real actual straight-line depreciation for each asset class is calculated in rows 41 to 193, based on net *capex* as commissioned.

Nominal asset values

The nominal opening *RAB* for each year is displayed in row 197. The nominal opening *RAB* for the first year of the current regulatory period (cell G197) is the same value as that calculated in the **Adjustment for previous period** sheet in accordance with Box 1 above (including any additional transitional adjustments that may be required).

The nominal opening *RAB* for the remaining years is calculated in accordance with Box 3 above. The nominal actual net *capex* for each asset class (rows 220 to 239) is equal to the real actual net *capex* indexed by actual inflation. The nominal actual depreciation (rows 242 to 261) is calculated as nominal actual straight-line depreciation (rows 332 to 351) less the actual inflation on the opening *RAB* for (rows 354 to 373).

2.4 Total actual RAB roll forward sheet

The **Total actual RAB roll forward** sheet brings together the relevant data from the **Adjustment for previous period** and **Actual RAB roll forward** sheets, to calculate the final closing *RAB* for the current regulatory period.

In this sheet, rows 6 to 136 calculate the interim closing *RAB* (row 138) for each year. This data is sourced from the **Actual RAB roll forward** sheet.

Rows 161 to 265 represent the required adjustments made for the final year of the previous period, contained in the **Adjustment for previous period** sheet. These once-off adjustments include:

- the difference between forecast and actual *capex* (and a compounded return on that difference), and
- the difference between forecast and actual *assets under construction* (and a compounded return on that difference).

The process for calculating the final closing *RAB* for the current regulatory period is set out in Box 5 below.

Box 5 – Adjusting for actual capex in final year of previous regulatory period

Calculating the difference between actual net capex and forecast net capex, and the allowed return on that difference

Interim closing *RAB* for the current regulatory period

\+ Difference between actual nominal net *capex* and forecast nominal net *capex* at actual CPI

\+ Compounded return on that difference for nominal net *capex*

\+ Difference between actual nominal *assets under construction* and forecast nominal *assets under construction*, at actual CPI.

\+ Compounded return on that difference for nominal *assets under construction*

= Final closing *RAB* for the current regulatory period

= Opening *RAB* for the first year of next period

Note:

- The opening *RAB* for first year of the next regulatory period becomes an input into the *PTRM* for the purposes of a revenue resest for the next regulatory period.

The final closing *RAB* for the current regulatory period is shown in cell K267. This figure becomes the opening asset base for the next regulatory period and is used as an input into the PTRM for the purposes of making the next transmission determination.

Figure 4 provides an example of the **Total actual *RAB* roll forward** sheet.

Figure 4: Total actual RAB roll forward sheet

	A	B	C	D	E	F	G	H	I	J	K
1											
2		**Total Asset Base Roll Forward**									
3											
4		**Year**				**2006-07**	**2007-08**	**2008-09**	**2009-10**	**2010-11**	**2011-12**
5											
6		Nominal Opening Regulated Asset Base				2,400.00	2,617.27	2,668.66	2,687.75	2,706.35	2,697.33
27											
28		Nominal Actual Net Capex				40.12	63.93	19.59	60.83	26.81	38.15
49											
50		Nominal Actual Depreciation (economic)				- 13.05	- 12.54	- 0.50	- 42.23	- 35.83	- 22.96
71											
72		Nominal Prudent Additional Capex Allowance				120.00					
93											
94		Nominal Foregone Return on Prudent Additional Capex				-					
115											
116		Nominal Assets Under Construction				70.20					
137											
138		**Interim Closing Regulated Asset Base**				**2,617.27**	**2,668.66**	**2,687.75**	**2,706.35**	**2,697.33**	**2,712.52**
159											
160		Difference Between Actual and Forecast Net Capex									2.09
181											
182		Return on Difference - Net Capex									1.16
203											
204		Difference Between Actual and Forecast Assets Under Construction									1.80
225											
226		Return on Difference - Assets Under Construction									1.00
266											
267		**Closing Regulated Asset Base**									**2,718.57**
288											

3 Glossary

This handbook uses the following definitions.

Assets under construction means the value of *capex* on assets not yet commissioned

Capex means capital expenditure

Opex means operating and maintenance expenditure

RAB means the regulatory asset base of a TNSP